Lab Assignment

Cybersecurity Professional Program

Introduction to Python for Security

Network Communication

PY-06-L3
Test Communication

Project Objective

Implement the code required to create client and server sockets, and to establish communication between them.

Lab Mission

Create a server socket and a client socket and enable them to communicate with each other.

Lab Duration

15 - 25 minutes

Requirements

- Basic knowledge of Python.

Resources

- Environment & Tools
    - Windows, macOS, Linux
        - PyCharm
        - Python 3

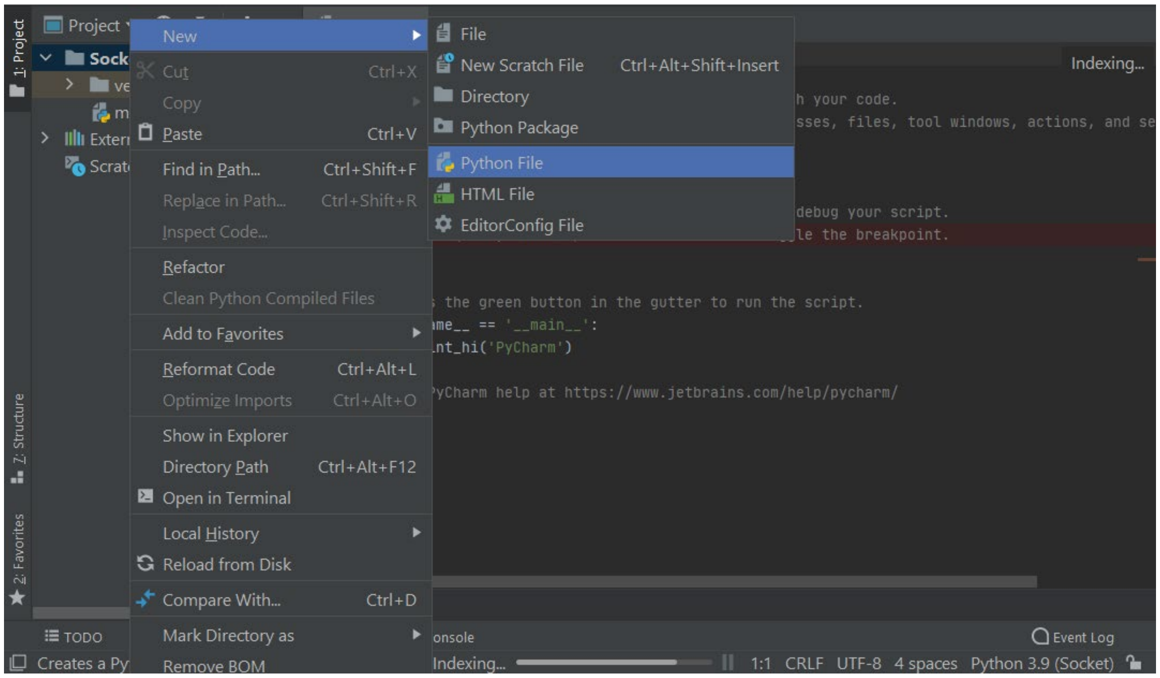
Textbook References

- Chapter 6: Network Communication
    - Section 3: Test Communication

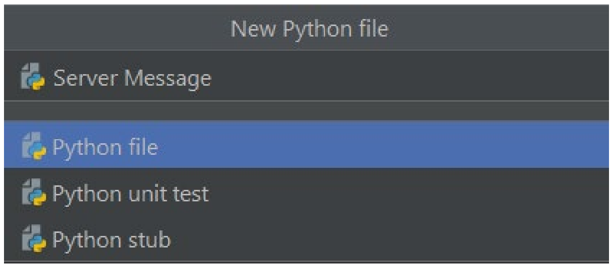
Lab Task 1: Server Socket Creation

In this task, you will create a server socket to wait for a connection from a client, and send a message to it.

1 In the PyCharm project created in L1, create a new Python file by right-clicking the projects folder, and selecting **New → Python File**. Name the file **Server Message**.



```
h your code.
sses, files, tool windows, actions, and se
debug your script.
le the breakpoint.
 the green button in the gutter to run the script.
me__ == '__main__':
nt_hi('PyCharm')
yCharm help at https://www.jetbrains.com/help/pycharm/
```



2 Import the **socket** module to the file.

```
import socket
```

3 Create a socket variable.

```
import socket

sock = socket.socket()
```

4 Bind the socket to accept connections from all IP addresses on port 4444.

```
import socket

sock = socket.socket()

sock.bind(("0.0.0.0", 45000))
```

5 Allow only one connection to the socket.

```
import socket

sock = socket.socket()

sock.bind(("0.0.0.0", 45000))

sock.listen(1)
```

6 Allow the server to accept connections, and save the connection object and the address to variables.

```
import socket

sock = socket.socket()

sock.bind(("0.0.0.0", 45000))

sock.listen(1)

conn, addr = sock.accept()
```

7 Send a welcome message to the connected client.

```
import socket

sock = socket.socket()

sock.bind(("0.0.0.0", 45000))

sock.listen(1)

conn, addr = sock.accept()

conn.send("Welcome to the server!")
```

8 Encode the message sent to the client.

```
import socket

sock = socket.socket()

sock.bind(("0.0.0.0", 45000))

sock.listen(1)

conn, addr = sock.accept()

conn.send("Welcome to the server!".encode())
```

9 Accept a message from the client and print it.

```python
import socket

sock = socket.socket()

sock.bind(("0.0.0.0", 45000))

sock.listen(1)

conn, addr = sock.accept()

conn.send("Welcome to the server!".encode())

print(conn.recv(2048).decode())
```

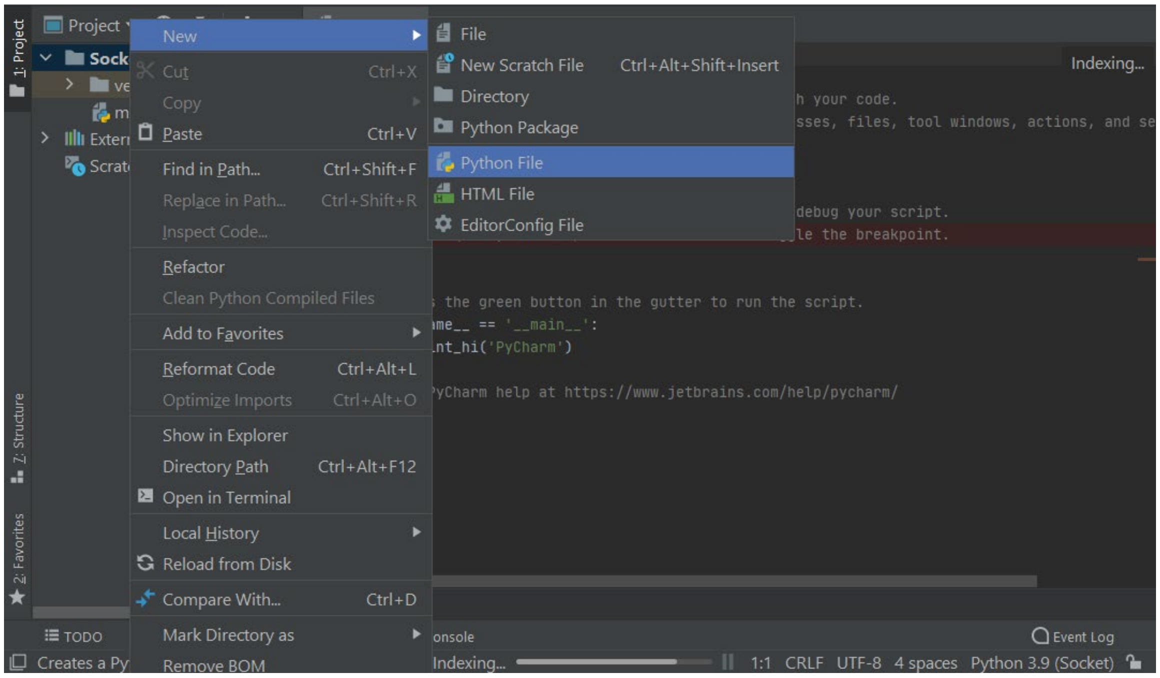
10 Close the connection.

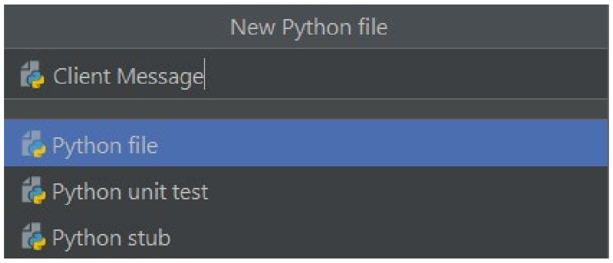
```python
import socket

sock = socket.socket()

sock.bind(("0.0.0.0", 45000))

sock.listen(1)

conn, addr = sock.accept()

conn.send("Welcome to the server!".encode())

print(conn.recv(2048).decode())

sock.close()
```

Lab Task 2: Client Socket Creation

In this task, you will create a client socket to connect to the server, receive a message from it, and reply to the message.

1 Create a new Python file by right-clicking the projects folder, and selecting **New → Python File**. Name the file **Client Message**.





2 Import the **socket** module to the file.

```
import socket
```

3 Create a socket variable.

```
import socket

sock = socket.socket()
```

4 Connect the socket to the listener in the server.

```
import socket

sock = socket.socket()

sock.connect(("127.0.0.1", 45000))
```

5 Allow the client to receive the message from the server, and print it.

```
import socket

sock = socket.socket()

sock.connect(("127.0.0.1", 45000))

print(sock.recv(2048).decode())
```

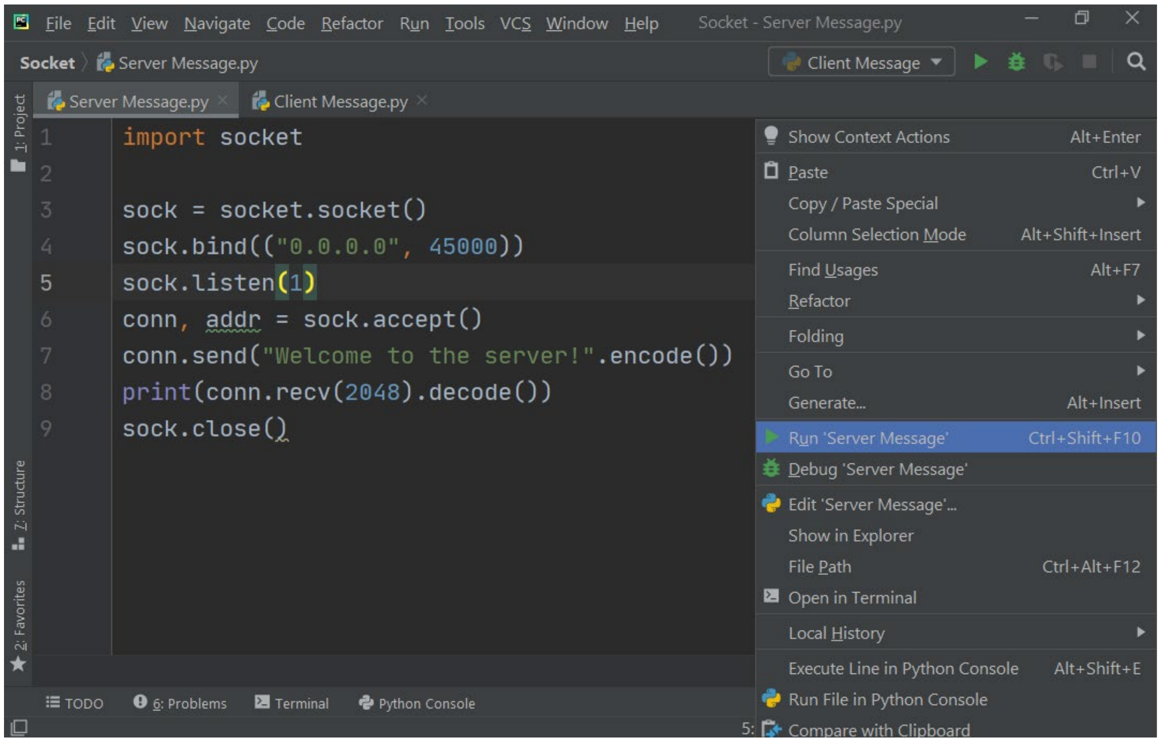
6 Return a message to the server notifying it that the client received the message.

```
import socket

sock = socket.socket()

sock.connect(("127.0.0.1", 45000))

print(sock.recv(2048).decode())

sock.send("Thanks!".encode())
```

7 Close the connection.

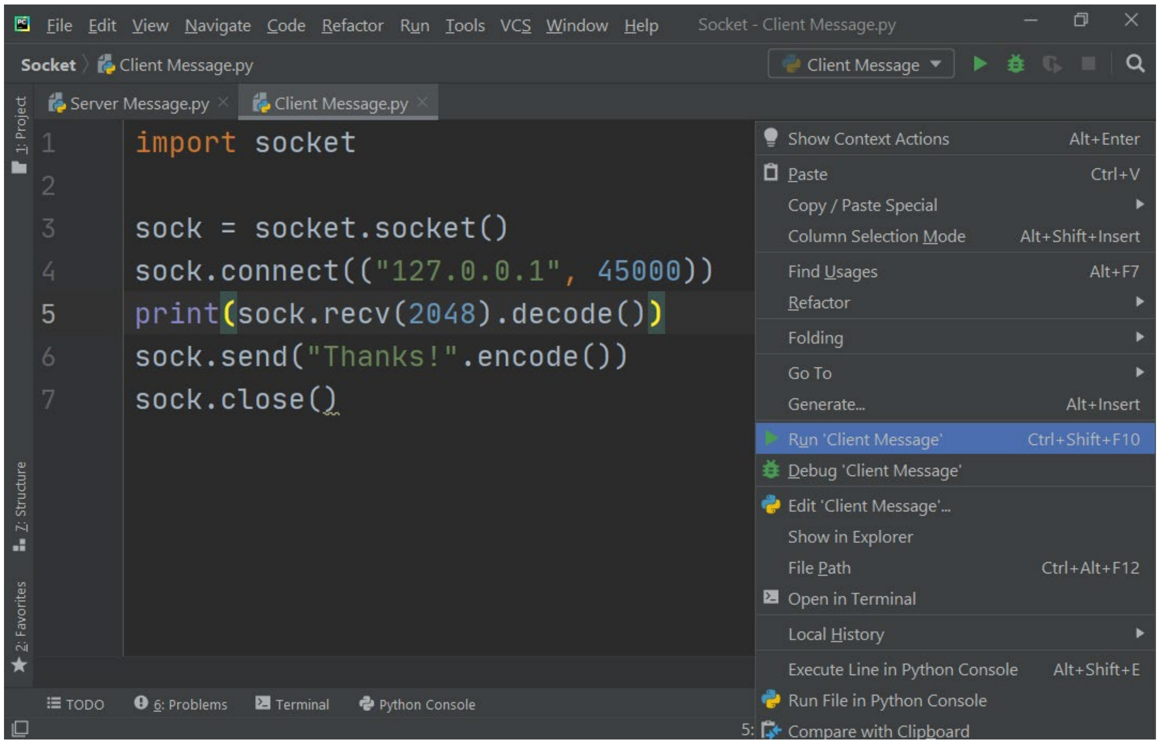
```
import socket

sock = socket.socket()

sock.connect(("127.0.0.1", 45000))

print(sock.recv(2048).decode())

sock.send("Thanks!".encode())

sock.close()
```

8 Execute the server script.



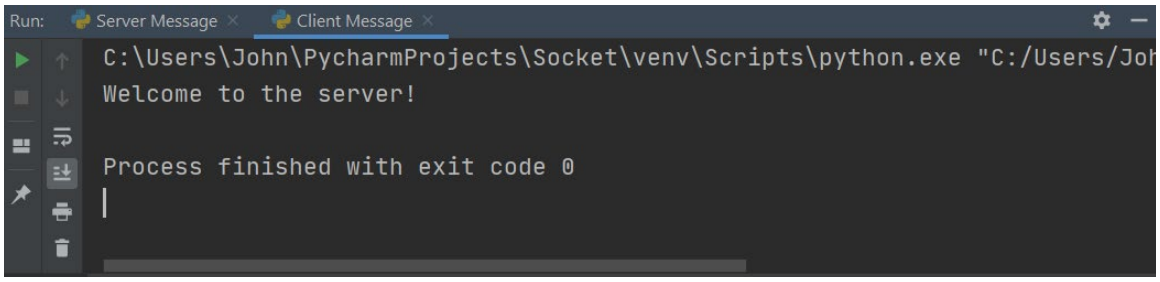
```
import socket

sock = socket.socket()
sock.bind(("0.0.0.0", 45000))
sock.listen(1)
conn, addr = sock.accept()
conn.send("Welcome to the server!".encode())
print(conn.recv(2048).decode())
sock.close()
```

9 Execute the client script.



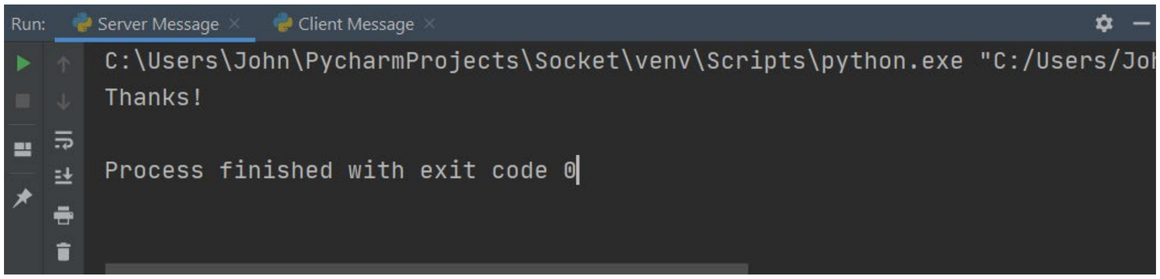
```python
import socket

sock = socket.socket()
sock.connect(("127.0.0.1", 45000))
print(sock.recv(2048).decode())
sock.send("Thanks!".encode())
sock.close()
```

10 Notice the message the client received.



```
C:\Users\John\PycharmProjects\Socket\venv\Scripts\python.exe "C:/Users/Joh
Welcome to the server!

Process finished with exit code 0
```

11 Notice the message the server received.



```
C:\Users\John\PycharmProjects\Socket\venv\Scripts\python.exe "C:/Users/Joh
Thanks!

Process finished with exit code 0
```